

WE CLAIM AS OUR INVENTION:

1. A method for assisting identification of a defective functional unit in a technical system comprising a plurality of functional units, said method comprising the steps of:

subjecting said technical system to a test to obtain a first test result relating to operation of said technical system; and

using a test model in which information is compiled with respect to which of said functional units were tested in said test, and using a system model in which information is compiled regarding assembly of said functional units in said technical system, automatically processing said test result by analyzing said test result to determine a group of said functional units which could be defective based on said test result, thereby obtaining an analysis result, and using said analysis result to assign respective defect probabilities to the functional units in said group.

2. A method as claimed in claim 1 comprising comparing the respective defect probabilities of said functional units in said group to a defect probability limit, and designating any of said functional units in said group as being defective that has a defect probability assigned thereto that exceeds said probability limit.

3. A method as claimed in claim 2 wherein said test is a first test, and comprising the additional step of, if none of said respective defect probabilities assigned to said functional units in said group exceeds said defect probability limit, designating a second test which more precisely refines the respective defect probabilities of the functional units in said group.

4. A method as claimed in claim 3 wherein the step of designating a second test comprises designating a plurality of second test suggestions; and

automatically presenting said plurality of second test suggestions according to at least one criterion that characterizes a relevancy of the respective test suggestions for identifying a defective functional unit in said group.

5. A method as claimed in claim 4 wherein said plurality of test suggestions includes a most relevant test suggestion, and automatically implementing said most relevant test suggestion as said second test.

6. A method as claimed in claim 3 comprising the additional steps of:

(a) implementing said second test on said technical system to obtain a second test result;

(b) using said first test result, said information from said test model as to which of said functional units was tested, said information from said system model as to said assembly of said function units in said technical system, analyzing said second test result to more precisely refine the respective defect probabilities of the functional units in said group, thereby obtaining respective, more precise defect probabilities;

(c) comparing said respective, more precise defect probabilities to said defect probability limit and designating any of said functional units in said group having a more precise defect probability that exceeds said defect probability limit as defective; and

(d) if none of said respective, more precise defect probabilities exceeds said defect probability limit, designating a further test of said functional units in said group to more precisely refine the respective more precisely refined defect probabilities obtained in step (b), and automatically implementing said further test.

7. A method as claimed in claim 6 comprising repeating step (c) until at least one of said respective defect probabilities is more precisely refined so as to exceed said defect probability limit.

8. A method as claimed in claim 6 wherein step (c) comprises designating a plurality of further tests for more precisely refining the respective more precisely defined defect probabilities obtained in step (b), automatically presenting said plurality of further tests according to at least one criterion representing a relevancy of the respective further tests for identification of a defective functional unit, and automatically implementing one of said plurality of further tests that has a highest relevancy for identification of a defective functional unit.

9. A method as claimed in claim 1 wherein each of said functional units in said group has a pre-test defect probability existing before said first test, and wherein the step of assigning the respective defect probabilities to said functional units in said group comprises, for each of said functional units in said group, formulating a mathematical combination of said pre-test defect probability and a defect probability based on said test.

10. A method as claimed in claim 9 comprising formulating said mathematical combination using a Bayesian network model.

11. A method as claimed in claim 1 comprising employing exchangeable structural units as said plurality of functional units in said technical system.

12. A method as claimed in claim 1 comprising employing, as one of said plurality of functional units in said technical system, a connection between other functional units in said technical system.

13. A method as claimed in claim 12 comprising selecting said connection from a group consisting of electrical signal transmitters and optical signal transmitters.

14. A method as claimed in claim 12 comprising employing an energy supply connection as said connection.

15. A method as claimed in claim 1 comprising testing individual functioning of at least one of said plurality of functional units in said test.

16. A method as claimed in claim 1 comprising testing multiple functional units, within said plurality of functional units, along a test signal path as said test.

17. A method as claimed in claim 1 comprising selecting said test from among a plurality of different tests in a computerized test program by parameterization.

18. A method as claimed in claim 17 wherein the step of testing said technical system comprises implementing a plurality of tests, from among said different tests in said test program, having a common functional form, as a test block, and calling said test with a single call command within said test program.

19. A method as claimed in claim 18 comprising, using said test model, compiling information as to which of said functional units was tested by said test block.

20. A method as claimed in claim 19 comprising generating said test model by configuring a test program model of said technical system comprising a specification of said test block.

21. A method as claimed in claim 20 comprising specifying said test block by at least one criterion selected from the group consisting of purpose, significant parameters and respective ones of said functional units.

22. A method as claimed in claim 1 comprising generating said test model based on said plurality of functional units.

23. A method as claimed in claim 22 comprising generating said test model by configuring a super test model of said technical system from a plurality of further technical systems related to said technical system to be tested.